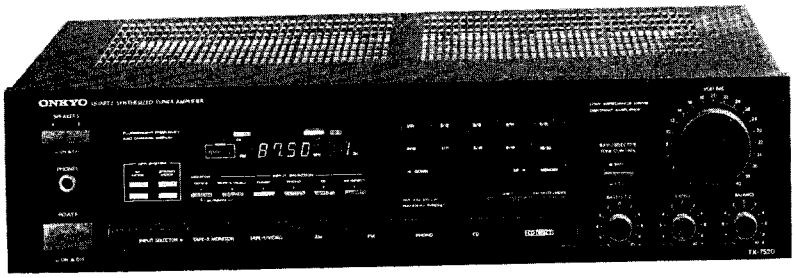
TX-7520

SERIAL NO. 3289

ONKYO SERVICE MANUAL

QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-7520



Black and Silver models

SAFETY-RELATED COMPONENT WARNING!!
COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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ONKYO AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

Power output:	45 watts per channel,min RMS,at 8 ohms, both channels driven,from 40Hz to 20kHz, with no more than 0.1% THD.	
Music Power Output:	2 ×130 watts at 4 ohms,1kHz (DIN)	
	2 ×80 watts at 8 ohms,1kHz (DIN)	
Continuous Power Output:	2 ×70 watts at 4 ohms,1kHz (DIN)	
	2 ×55 watts at 8 ohms,1kHz (DIN)	
Total Harmonic Distortion:	0.1% at 1 watt output	
IM Distortion:	0.1% at 1 watt output	
Damping Factor:	35 at 8 ohms	
Frequency Response:	20-30,000Hz ± 1dB	
RIAA Deviation:	20-20,000Hz ±0.8dB	
Sensitivity and Impedance:	Phono:	2.5mV/50kohms
	CD/Tape Play:	150mV/50kohms
	Tape Rec:	150mV/3.5kohms (Phono)
Phono overload:	120mV RMS at 1kHz,0.1% THD	
Signal-to-Noise Ratio:	Phono:	85dB(at 10mV input, A weighted)
		75dB(IHF A-202)
	Tape:	95dB(A weighted)
		80dB(IHF A-202)
Tone Controls:	Bass:	± 10dB at 100Hz
	Treble:	± 10dB at 10kHz

TUNER SECTION

FM:

Tuning Range:	87.50-108.00MHz(50kHz steps)	
Usable Sensitivity:	Mono:	12.4dBf, 2.3μV, IHF 1.2 μV, 75 ohms DIN
	Stereo:	2.5 μV,75 ohms
50dB Quieting Sensitivity:	Mono:	2.2 μV,75 ohms
	Stereo:	22μV,75 ohms
Capture Ratio:	1.5dB	
Image Rejection Ratio:	85dB	
IF Rejection Ratio:	90dB	
Signal-to-Noise Ratio:	Mono:	70dB
	Stereo:	65dB
Selectivity:	50dB DIN (±300kHz,40kHz Devi.)	
AM Suppression Ratio:	50dB	
Harmonic Distortion:	Mono:	0.15%
	Stereo:	0.30%
Frequency Response:	30-15,000Hz ±1.5dB	
Stereo Separation:	40dB at 1kHz	
	30dB at 100-10,000Hz	
Muting level:	17.2dBf, 2μV,75 ohms	
Stereo Threshold:	17.2dBf, 2μV,75 ohms	

AM:

Tuning Range:	522-1,611kHz(9kHz steps)
Usable Sensitivity:	30μV
Image Rejection Ratio:	40dB
IF Rejection Ratio:	40dB
Signal-to-Noise Ratio:	40dB
Harmonic Distortion:	0.8%

GENERAL

Dimensions(W×H ×D):	435×110×317mm
	17-1/8" ×4-5/16"×12-1/2"
Weight:	7.0kg.,15.4lbs.

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

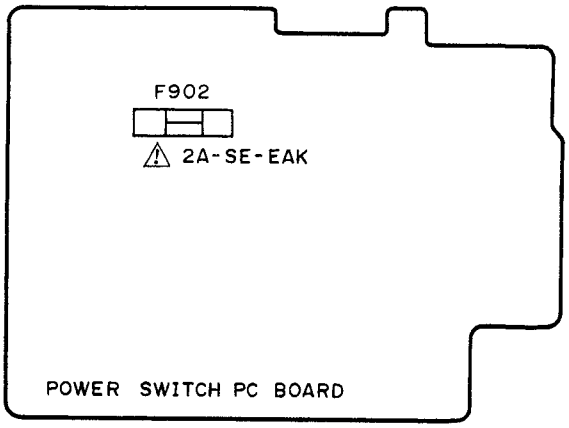
1.Replacing the fuses

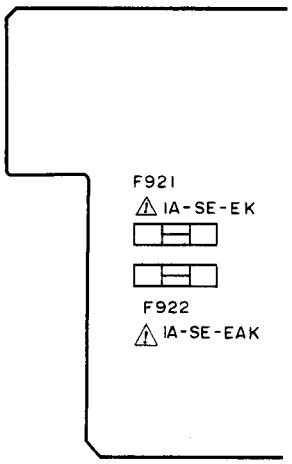
For continued protection against fire hazard,replace only with same type and same rating fuse.

Circuit no.	Part no.	Description
F902	252074	2A-SE-EAK,Primary
F921,F922	252070	1A-SE-EAK,Secondary

2.Memroy preservation

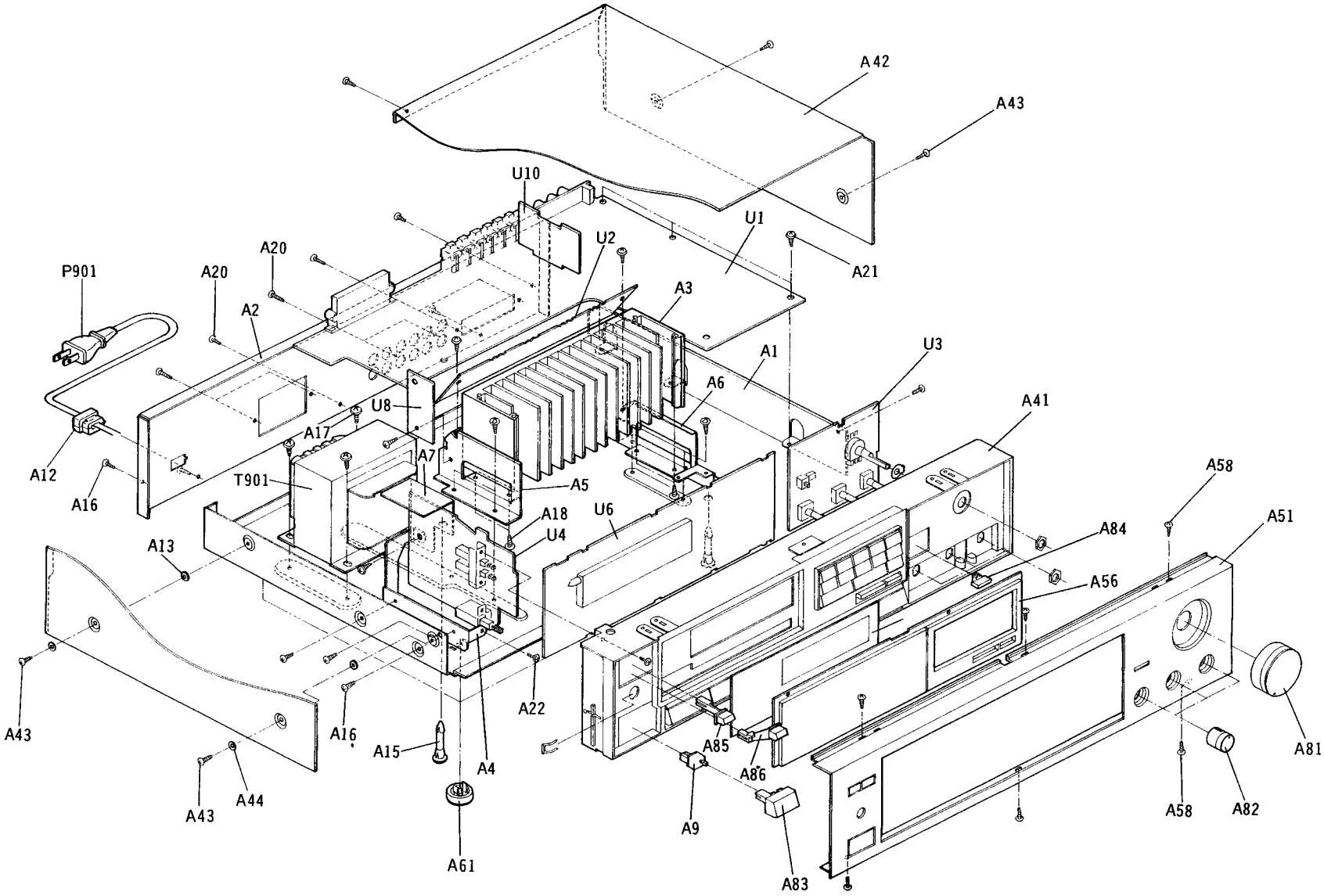
This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory,the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.





TUNER AND SELECTOR SWITCH PC BOARD

EXPLODED VIEW



PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A1	27100158	Chassis
A2	27121090	Back panel
A3	27160224	Radiator
A4	27141247	Bracket POWER
A5	27141248	Bracket LH
A6	27141249	Bracket RH
A7	28175152	Insulated plate
A9	27273097	Joint
A10	28133196B	Back plate
A12	27300750	Strainrelief
A13	27270147	Spacer
A15	27190266	KGLS-12R,Holder
A16	834430088	3TTS+8B(BC),Tapping screw
A17	830440089	4TTC+8C(BC),Tapping screw
A18	838440089	4TTB+8C(BC),Tapping screw
A19	834430128	3TTS+12B(BC),Tapping screw
A20	834430108	3TTS+10B(BC),Tapping screw
A21	831130088	3TTW+8B,Tapping screw
A22	82143006	3P+6F(BC),Pan head screw
A23	833430080	3TTP+8P(BC),Tapping screw
A31	27110412B	Front bracket ass'y <B>
	27110411B	Front bracket ass'y <S>
A41	28184391	Top cover <B>
	28184390	Top cover <S>
A42	834430088	3TTS+8B(BC),Tapping screw
A43	870048	3 × 8×0.8t,Nylon washer
A51	1A089121	Front panel ass'y <B>
	1A088121	Front panel ass'y <S>
A56	28191460	Clear plate
A58	833430080	3TTP+8P(BC),Tapping screw
A61	27175142	Leg
A81	28323308	Knob VOLUME <B>
	28323307	Knob VOLUME <S>
A82	28323310	Knob TONE <B>
	28323309	Knob TONE <S>
A83	28323241	Knob POWER <B>
	28323249	Knob POWER <S>
A84	28323312	Knob PUSH <B>
	28323311A	Knob PUSH <S>
A85	28323314	Knob SPEAKER A <B>
	28323313	Knob SPEAKER A <S>
A86	28323316	Knob SPEAKER B <B>
	28323315	Knob SPEAKER B <S>
F902	259074	2A-SE-EAK,Primary fuse
F921,F922	252070	1A-SE-EAK,Secondary fuse
P901	253128B or 253130A	AS-CEE,Power suuply cord

REF. NO.	PART NO.	DESCRIPTION
Q521,Q522	2201783, 2201784 or 2201786	☆2SC3854-O, 2SC3854-Y or 2SC3854-P,Power transistors
Q523,Q524	2201773, 2201774 or 2201776	☆2SA1490-O, 2SA1490-Y or 2SA1490-P,Power transistors

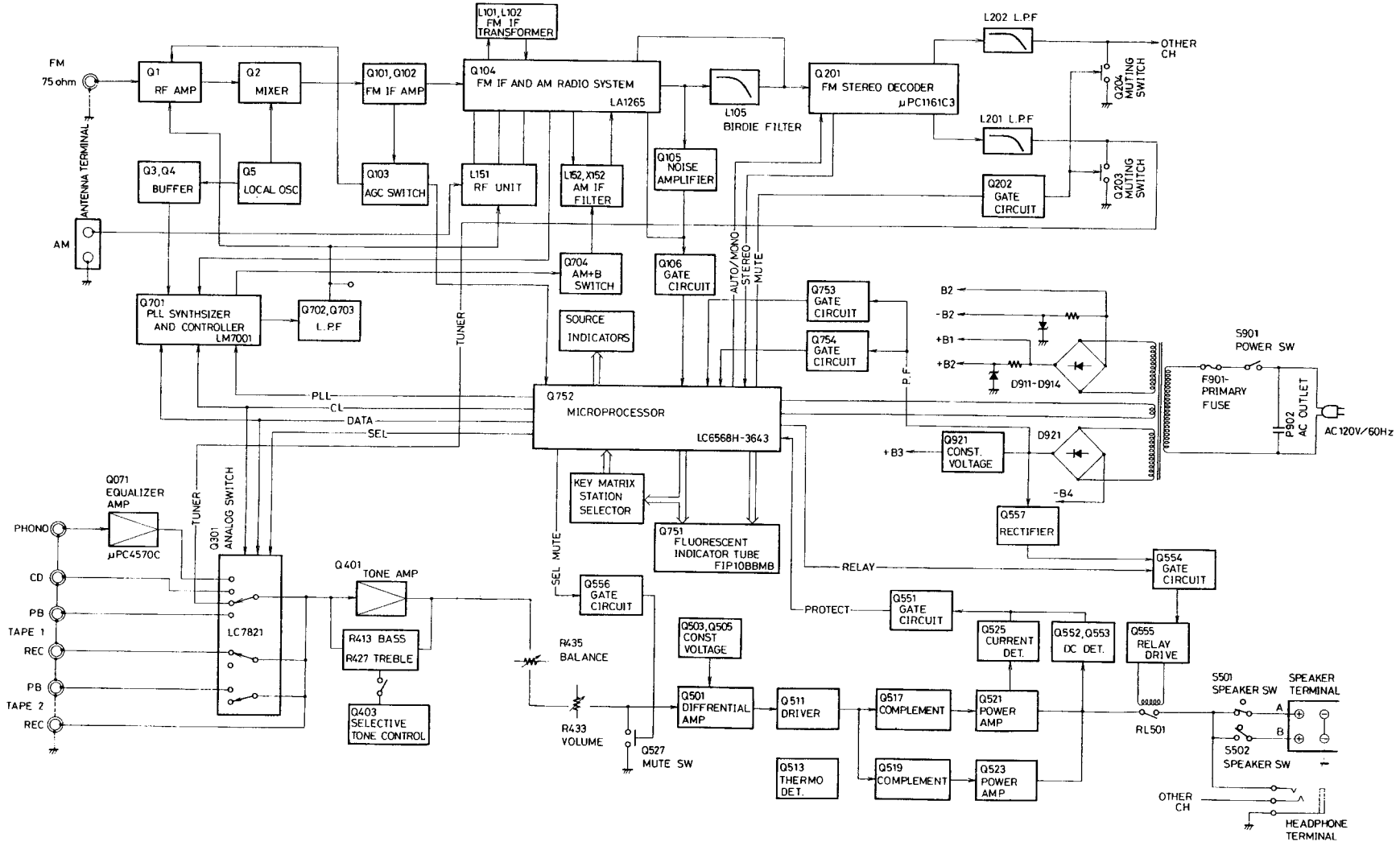
CAUTION:Replacement of transistor of mark ☆, if necessary, must be made from the same beta group (H_{FE}) as the original type.

T901	2300199A	NPT-955G,Power transfomer
U1	1A086543-1A	NAAR-3243-1A, Tuner and selector switch pc board
U2	1A086544-1	NAAF-3244-1,Power amplifier pc board ass'y
U3	1A086545-1A	NAAF-3245-1A, Tone control circuit pc board ass'y
U4	1A086546-1A	NASW-3246-1A, Power/Speaker switch pc board ass'y
U6	1A086548-1A	NADIS-3248-1A, Display circuit pc board ass'y
U8	1A086550-1	NAETC-3250-1,Pc board for holder
U10	1A086554-3	NAAF-3054-3,Equalizer amplifier pc board ass'y

NOTE:<B>:Only black model
<S>:Only silver model

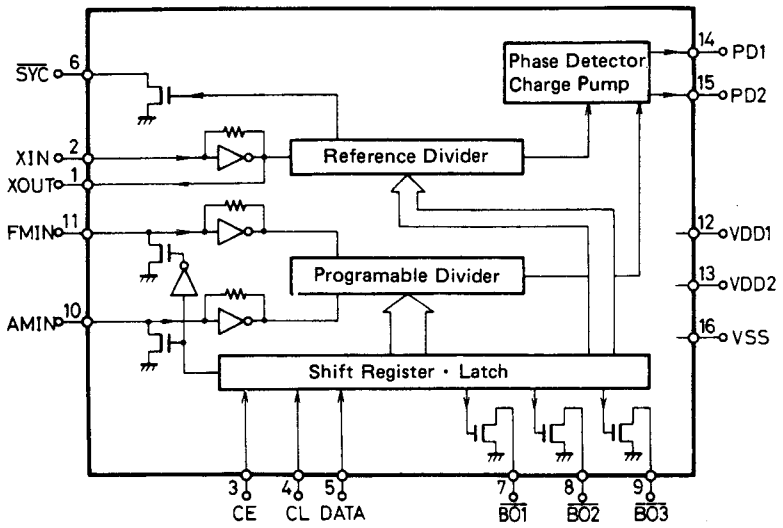
NOTE: THE COMPONENTS IDENTIFIED BY MARK⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

BLOCK DIAGRAM



BLOCK DIAGRAM OF IC

LM7001 (PLL frequency synthesizer)



Pin No.	Terminal	Description
1	XOUT	Connect to the 7.2 MHz crystal oscillator.
2	XIN	
3	CE	Chip enable terminal. Connect to the PLL terminal of LC6568H-3643.
4	CL	Serial clock input terminal. Connect to the CLOCK terminal of LC6568H-3643.
5	DATA	Serial data input terminal. Connect to the DATA terminal of LC6568H-3643.
6	$\overline{SYN}$	Not used.
7	$\overline{BO1}$	Phono control signal output terminal. "L" when phono.
8	$\overline{BO2}$	FM control signal output terminal. "L" when FM.
9	$\overline{BO3}$	AM control signal output terminal. "L" when AM.
10	AMIN	AM local oscillator input terminal.
11	FMIN	FM local oscillator terminal.
12	$V_{DD}1$	Power supply terminal for back-up.
13	$V_{DD}2$	Power supply terminal.
14	PD1	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies matched. The output is applied to the variable capacitor diode in the local oscillator through the low pass filters.
15	PD2	
16	Vss	Ground terminal.

LC6568H-3643 (Microprocessor)

Terminal Descriptions

Pin No.	Terminal	Description
1 2 3 4 5 6 7 8	D1 D2 D3 D4 D5 D6 D7 D8	These are the digit and key scan signal terminals. "H" when active.
9	DISPLAY	Display output terminal."H" when active.
10 11 12 13	K0 K1 K2 K3	These are the input terminal for key return signal source and diode matrix."H" when active.
14	AUTO STOP	Auto stop signal input terminal.Auto tuning stops when this terminal becomes the high level.
15	STEREO	This is the input terminal for detection of the stereo broadcast."L" when active.
16	PROTECT	This is the detection terminal for protection circuit.The speaker relay turns off when this terminal becomes the high level.
17	POWER OFF	This is the input terminal for detection of the stoppage of electric current."L" when the stoppage of electric current.
18	RELAY	This is the output terminal for control of the speaker relay."L" when active.
19	SEL MUTE	This is the muting output terminal when the selector key is operated."H" when active.
20	TU MUTE	This is the output terminal for muting control of tuner section."L" when active.
21	AUTO/MONO	This is the AUTO/MONO switching output terminal. "H" when AUTO.
22 23	VDP VCR	These are the output terminal for control of video signal.
24	MUTING	This is the output terminal for muting control. "L" when active.
25	POWER	This is the output terminal for power source.It is "H" for power on.
26	CD DC	This is the output terminal for control of CD direct. "H" when active.
27	CD D	This is the output terminal for indication of CD. "L" when active.
28	DX	This is the output terminal for indication of DX. "L" when active.
29	LOCAL	This is the output terminal for indication of LOCAL. "L" when active.
30	TEST	Test terminal.Connect to the ground.
31	Vss	Ground terminal.
32 33	X1 X2	Connect to the 4.00MHz ceramic oscillator.
34	RESET	This is the input terminal for reset. "L" when active
35	PLL	Connect to the terminal CE of PLL IC(LM7001).
36	DATA	This is the serial data output terminal.Connect to the terminal DATA of PLL IC and terminal DI of analog switch.
37	CLOCK	This is the serial clock output terminal.Connect to the terminal CI of PLL IC and terminal CL of analog switch.
38	SEL	Connect to terminal SEL of analog switch(LC7821).
39	SYSTEM IN	This is the input terminal for system code. "H" when active.
40	SYSTEM OUT	This is the input terminal for system code. "L" when active.
41	MONO	This is the output terminal for indication of MONO. "L" when active.
42	AUTO	This is the output terminal for indication of AUTO. "L" when active.
43	TAPE 2	This is the output terminal for indication of TAPE 2 "L" when active.
44	TAPE 1	This is the output terminal for indication of TAPE 1 "L" when active.
45	VREF	This is the input terminal for comparator reference voltage.
46	S IN	This is the signal strength input terminal.
47	TUNER	This is the output terminal for indication of TUNER. "L" when active.
48	PHONO	This is the output terminal for indication of PHONO. "L" when active.
49	CD	This is the output terminal for indication of CD. "L" when active.

Pin No.	Terminal	Description
50	RF IN	This is the input terminal for control of AGC. "H" when active.
51	VP	Pull-down resistor connection terminal of FIP controller/driver.
52 53 54 55 56 57 58 59 60 61 62 63	Sa Sb Sc Sd Se Sf Sg Sh Si Sj Sk Sl	These are the output terminal for segment signal. "L" when active.
64	VDD	This is the divice power source terminal.At the time of operation,the supply is 5V.The internal data memory(RAM) is maintained by means of the super capacitor.

Key and diode matrix

	D1 (1)	D2 (2)	D3 (3)	D4 (4)	D5 (5)	D6 (6)	D7 (7)
K3(13)	P4	P8	MEMORY	CD DIRECT	AM	TAPE 2	SYSTEM
K2(12)	P3	P7	SHIFT	AUTO/MONO	FM	TAPE 1	MODE
K1(11)	P2	P6	P10	UP	PHONO	VCR	AM9K
K0(10)	P1	P5	P9	DOWN	CD	VDP	FM50K
							Diode matrix

FM50K (FM band setting)

FM50K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europer	87.50 ~108.00MHz	50kHz	25kHz	10.7MHz
0	U.S.A.	87.9 ~107.9MHz	200kHz	25kHz	10.7MHz

AM9

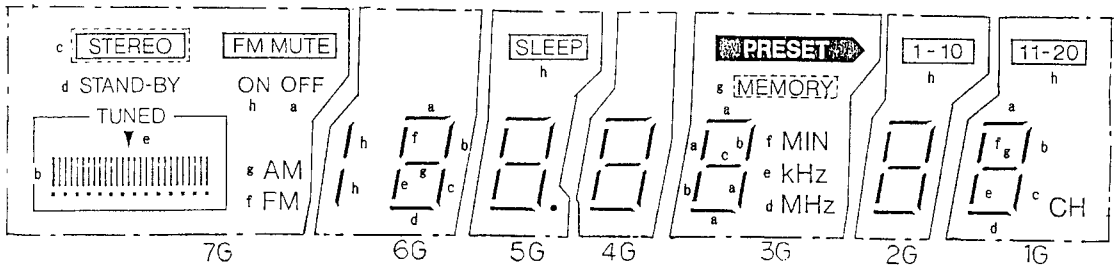
AM9K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europer	522 ~ 1611 kHz	9kHz	9kHz	450kHz
0	U.S.A.	530 ~ 1620 kHz	10kHz	10kHz	450kHz

Connection of fluorescent tube and microprocessor

	D7(7)	D6(6)	D5(5)	D4(4)	D3(3)	D2(2)	D1(1)
Sa(52)	OFF	a	a	a		a	a
Sb(53)	TUNED	b	b	b		b	b
Sc(54)	STEREO	c	c	c		c	c
Sd(55)	STANDBY	d	d	d	MHz	d	d
Se(56)	SEARCH	e	e	e	kHz	e	e
Sf(57)	FM/FM MUTE	f	f	f	MIN	f	f
Sg(58)	AM	g	g	g	MEMORY	g	g
Sh(59)	ON		SLEEP		A	B	

FIP10BBMB(Fluorescent tube)

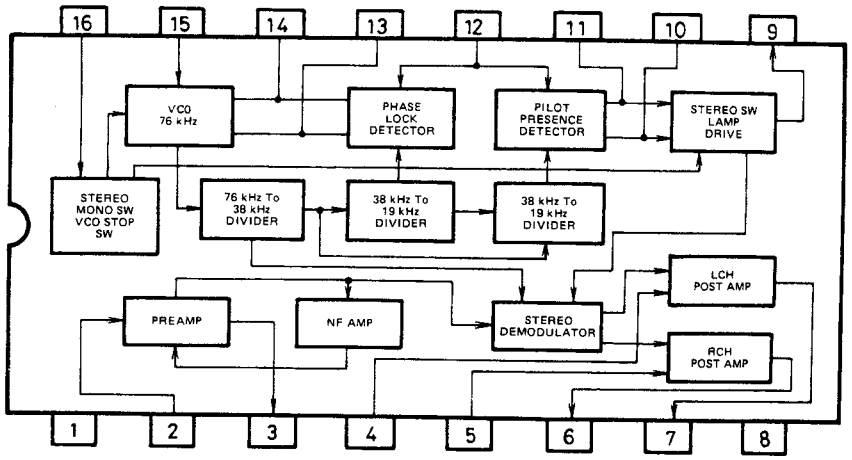
TERMINAL CONNECTION



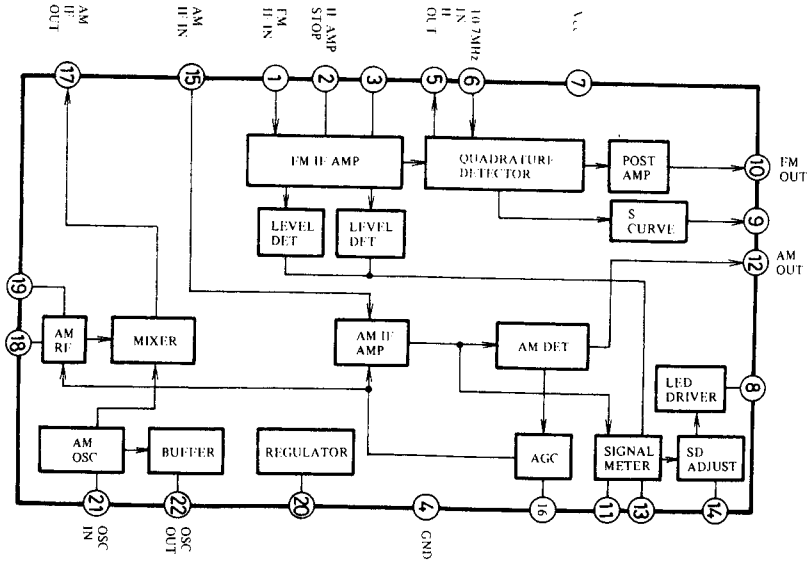
TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ELECTRODE	F	F	7G	P (S4)	P (i)	P (h)	7G	P (g)	P (S3)	P (S2)	7G	NC	6G	NP	NP	6G	NP	NP	5G	NP
TERMINAL NO.		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ELECTRODE		NP	4G	NC	3G	NP	NP	P (f)	3G	P (e)	P (d)	2G	P (c)	P (b)	P (a)	1G	P (S1)	NP	F	F

Notes F: Filament NP: No Pin
G: Grid NC: No Connection
P: Anode

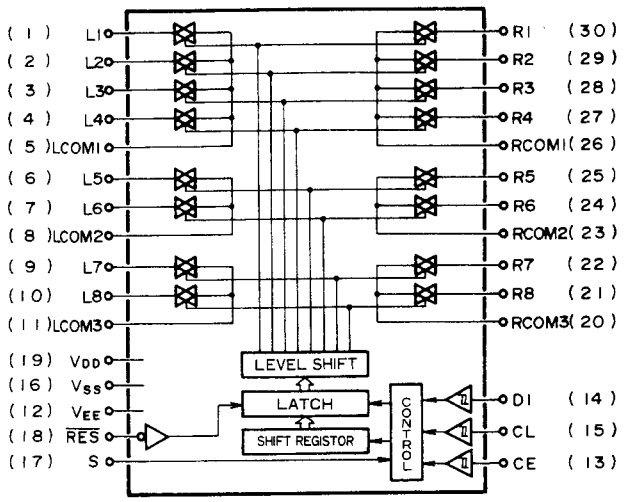
μPC1161C3 (FM stereo decoder)

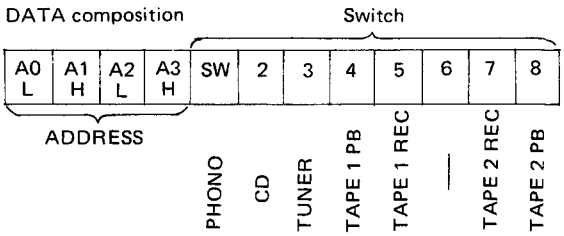


LA1266 (FM IF/AM radio system)



LC7821 (Analog switch)





The source becomes ON when the bit of switch becomes high.

PHONO sw1/5/7 · · · · H sw2/3/4/8 · · · · L

Pin No.	Terminal	Description
1 2 3 4 5 6 7 8 9 10 11	PHONO CD TUNER TAPE PB L COM 1 TAPE 1 REC —— L COM 2 TAPE 2 REC TAPE 2 PB L COM 3	Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data.
12	Vss	Negative power supply terminal. (−15V)
13	CE	Chip enable terminal. Connect to SEL terminal of LC6568H-3643.
14	D1	Serial data input terminal. Connect to DATA terminal of LC6868H-3643.
15	CL	Serial clock input terminal. Connect to CLOCK terminal of LC6868H-3643.

Pin No.	Terminal	Description
16	Vss	Ground terminal.
17	S	Selector terminal.
18	RES	Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF.
19	VDD	Power supply terminal. (+12V)
20 21 22 23 24 25 26 27 28 29 30	R COM 3 TAPE 2 PB TAPE 2 REC R COM 2 —— TAPE 1 REC R COM 1 TAPE 1 PB TUNER CD PHONO	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.

ADJUSTMENT PROCEDURES

Preparation

• Input

FM mono: 1kHz, 75kHz devi., 60dB/μV

FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz 7.5kHz devi.

AM: 400Hz, 30% mod.,

• Output

Connect the non-inductive type resistor of 8 ohms to the speaker terminals A of left and right channels unless otherwise noted.

Amplifier section

1. Idling current adjustment

Connect the DC voltmeter to the terminals IID and VCT on the power amplifier and power supply pc board.

Adjust the semi-fixed resistors R549 and R550 so that the indication of voltmeter is 7.5 ± 0.5mV.

Notes: VOLUME . . . . . Maximum, Open load, Adjust after switching on for 6 minutes.

• Standard knob position

INPUT SELECTOR. . . . . CD
TAPE MONITOR . . . . . SOURCE
LOUDNESS. . . . . OFF
VOLUME . . . . . Maximum
BASS/TREBLE/BALANCE. . . . . Center
SPEAKER . . . . . A
SELECTIVE TONE CONTROL. . . . . OFF

Reference specifications

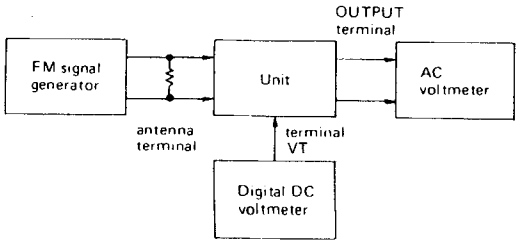
Tuned voltage	AM 522kHz	1.5 ±0.4V
	1611kHz	7.6 ±1.0V
	FM 87.50MHz	2.0 ±0.5V
	FM 108.00MHz	7.6 ±0.5V

Reference specifications

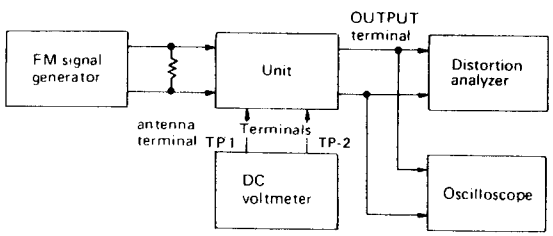
Tuned voltage	AM 522kHz	1.5 ±0.4V
	FM 87.50MHz	2.0 ±0.5V
Muting width		35 ± 10kHz
Muting level	FM	14±3 dB
Auto stop level	AM	Less than 72dB/m
	FM	Less than 18dBμ
Stereo indicator level		14± 4dBμ

FM section

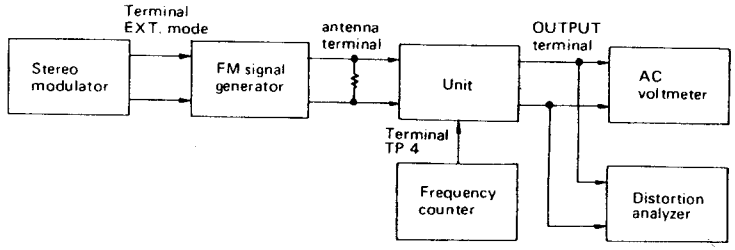
Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
I F	1	Fig.2	99.1MHz 1kHz,75kHz devi. 65dBf(60dB)	———	99.1MHz	DC voltmeter	L101	0±20mV	Set the muting switch to OFF. Repeat the steps 1 and 2 until no further adjustment is necessary.
	2					Distortion analyzer	L102	Minimum	
Tuning indicator level	1	Fig.2	99.1MHz 1kHz,75kHz devi. 19.2dBf(14dB)		99.1MHz	TUNED indicator	R101	Light on	
	2		99.1MHz 1kHz,75kHz devi. 18.2dBf(13dB)					Light off	
V C O		Fig.3	99.1MHz 1kHz,75kHz devi. 65dBf(60dB)	———	99.1MHz	Frequency counter	R201	19kHz±10Hz	Set the muting switch to ON.
Stereo distortion		Fig.3	99.1MHz Ext. modulation 65dBf(60dB)	L+R 1kHz 67.5kHz devi.	99.1MHz	Distortion analyzer	IF on frout end	Minimum	
Stereo separation	1	Fig.3	99.1MHz Ext. modulation 65dBf(60dB)	Lch. 1kHz	99.1MHz	Rch. AC voltmeter	R202	Minimum	Maximum and same separation
	2			Rch. 1kHz		Lch. AC voltmeter		Minimum	



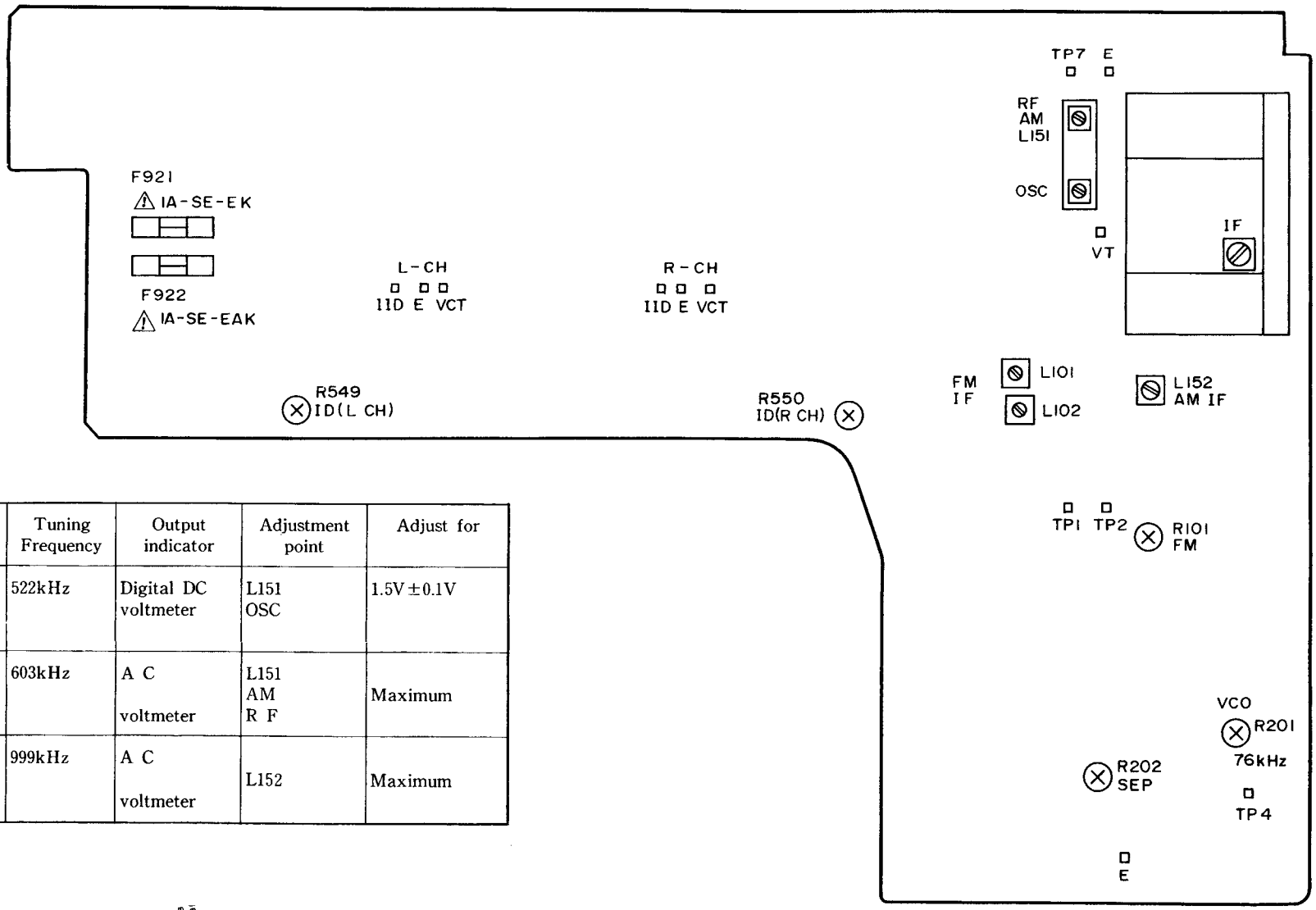
<Fig.1> Confirmation of tuned voltage



<Fig.2>

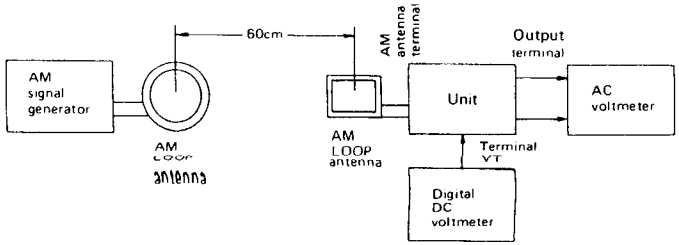


<Fig.3>

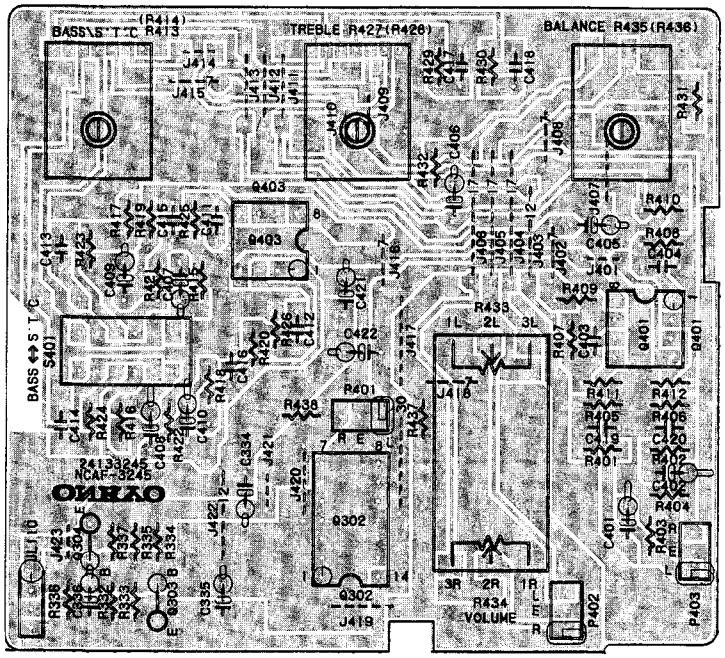


AM section

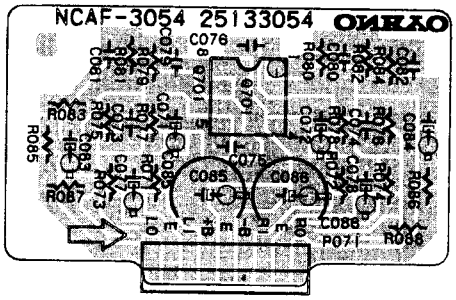
Step	AM SG output	Tuning Frequency	Output indicator	Adjustment point	Adjust for
1	———	522kHz	Digital DC voltmeter	L151 OSC	1.5V ±0.1V
2	603kHz,60dB/m 400Hz 30% mod.	603kHz	A C voltmeter	L151 AM R F	Maximum
3	999kHz,30dB/m 400Hz 30% mod.	999kHz	A C voltmeter	L152	Maximum



PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



TONE CONTROL CIRCUIT PC BOARD



EQUALIZER AMPLIFIER PC BOARD

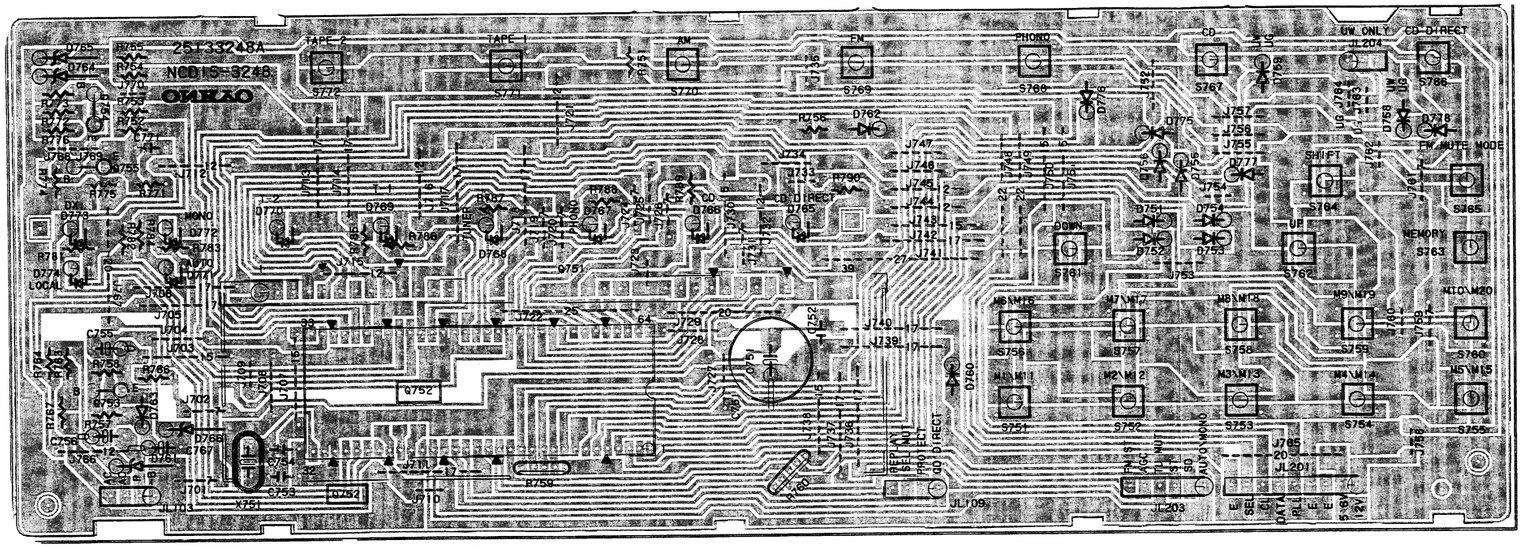
Tone control circuit pc board (NAAF-3245-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q401-Q404	22240050	μPC4570C
	Capacitors	
C401,C402	354780479	4.7 μF,50V,Elect.
C405,C406	354780479	4.7 μF,50V,Elect.
C407,C408	354780339	3.3 μF,50V,Elect.
C409,C410	354780109	1 μF,50V,Elect.
C421,C422	354780339	3.3 μF,50V,Elect.
C423,C424	354741009	10μF,16V,Elect.
	Resistors	
R413,R414	5104229	N14RHC100KWT22Z,Variable,BASS
R427,R428	5104229	N14RHC100KWT22Z,Variable, TREBLE
R433,R434	5104227A	N16RGH100KA25Z,Variable, VOLUME
R435,R436	5104228	N11RHC250KWT22Z,Variable, BALANCE
	Switch	
S401	25035588	NPS-142-L550,Selector
	Sockets	
P402	2000765	NSAS-6P721
P403	2000556	NSAS-6P512

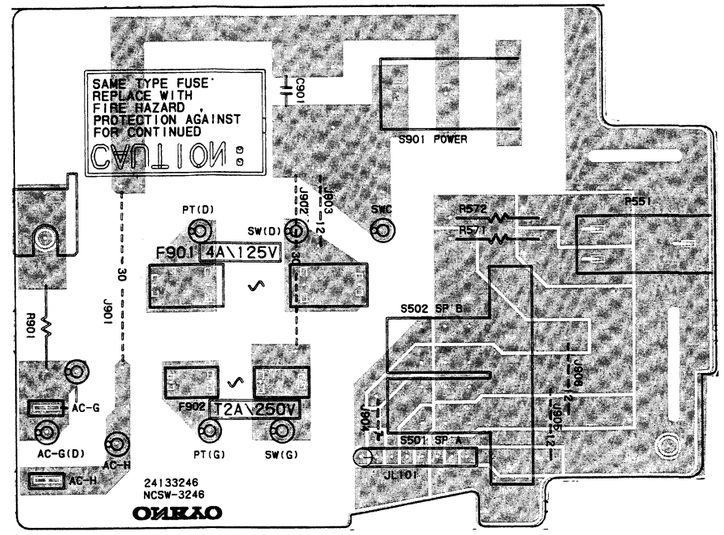
EQUALIZER AMPLIFIER PC BOARD(NAAF-3054-3)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q071	22240050	μPC4570C
	Capacitors	
C071,C072	354780229	2.2 μF,50V,Elect.
C077,C078	354721019	100 μF,6.3V,Elect.
C083,C084	354780229	2.2 μF,50V,Elect.
C085,C086	354742219	220 μF,16V,Elect.
	Plug	
P071	25055334	NPLG-9P317

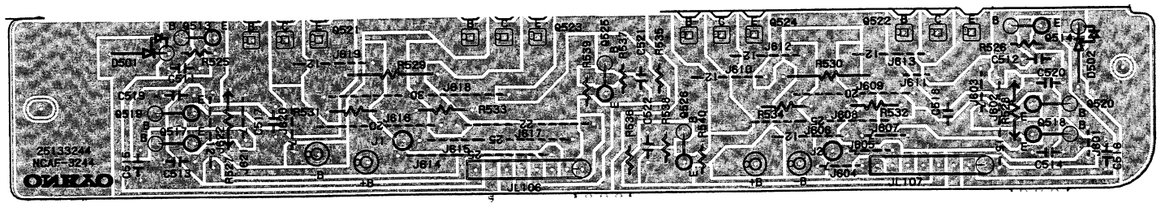
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



DISPLAY CIRCUIT PC BOARD



POWER/SPEAKER SWITCH PC BOARD



POWER AMPLIFIER PC BOARD

POWER AMPLIFIER PC BOARD(NAAF-3244-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q513,Q514	2211255	2SC1815-GR
Q517,Q518	2211654 or	2SC2235-Y or
	2211653	2SC2235-O
Q519,Q520	2211644 or	2SA965-Y or
	2211643	2SA965-O
Q521,Q522	2201783,	☆2SC3854-O,
	2201784 or	2SC3854-Y or
	2201786	2SC3854-P
Q523,Q524	2201773,	☆2SA1490-O,
	2201774 or	2SA1490-Y or
	2201776	2SA1490-P

CAUTION:Replacement for transistor of mark☆, if necessary, must be made from the same beta group (H) as the original type.

Ex. 2SA1490-O 2SC3854-O

Same beta group

Q525,Q526	2211732 or	2SC1845-F or
	2211733	2SC1845-E
	Diodes	
D501,D502	4000068 or	VD1222 or
	4000120	KB-265
R527,R528	**Resistors** 442522714	270ohm,1/2W,Metal oxide film
R529,R530	441620104	1ohm,1W,Metal oxide film
R531-R534	4500009	0.47ohm,2W,Metal plate
	Terminals	
	25060118	NTM-1M52(for leg of power transistor)

DISPLAY CIRCUIT PC BOARD(NADIS-3248-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q752	22240153	LC6568-3643
	Transistor	
Q753-Q755	2211255	2SC1815-GR
	Fluorescent tube	
Q751	212053	FIP10BBMB
	Diodes	
D751-D756	223163	1SS133
D758,D759	223163	1SS133
D760,D763	223163	1SS133
D761	224650472	HZ4.7EB2
D765,D766	224650623	HZ6.2EB3 or
	224150623	05AZ6.2Z
D775-D778	223163	1SS133
	L.E.Ds	
D766-D771	225137CG,	SEL2413E-CG
D774	225137DG or	SEL2413E-DG or
	225137DY	SEL2413E-DY
D772,D773	225142	SEL2913K
	Osc. element	
X751	3010099	CSA4.00MG,Ceramic
	Capacitors	
C751	3020027 or	0.047F,5V or
	3000051	0.047F,5.5V, Super
C767	354780109	1 μF,50V,Elect.
	Resistors	
R759	49163473404	47k ×4,1/10W,Network
R760	49163104404	100k×4,1/10W,Network
	Switches	
S751-S765	25035548	NPS-111-S510,Push
S767-S772	25035548	NPS-111-S510,Push
	Holder	
	27190619	L.E.D
	Cushion	
	28140825	

POWER AND SPEAKER SWITCH PC BOARD(NASW-3246-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
C901	3500065A	0.01μF,AC400V/125V,Capacitor IS
C901a	27300601	Cover for C901
R571,R572	441623914	390ohm,1W,Metal oxide film resistors
S501,S502	25035517	NPS-222-L479,Push switch, SPEAKER
S901	25035550	NPS-111-L512P, Push switch, POWER
P551	25045139	HLJ0540-01-010,Stereo headphone terminal
F902	252074	2A-SE-EAK, Primary fuse
	25050065	YSH4037, Fuseholders for F902

NOTE:THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

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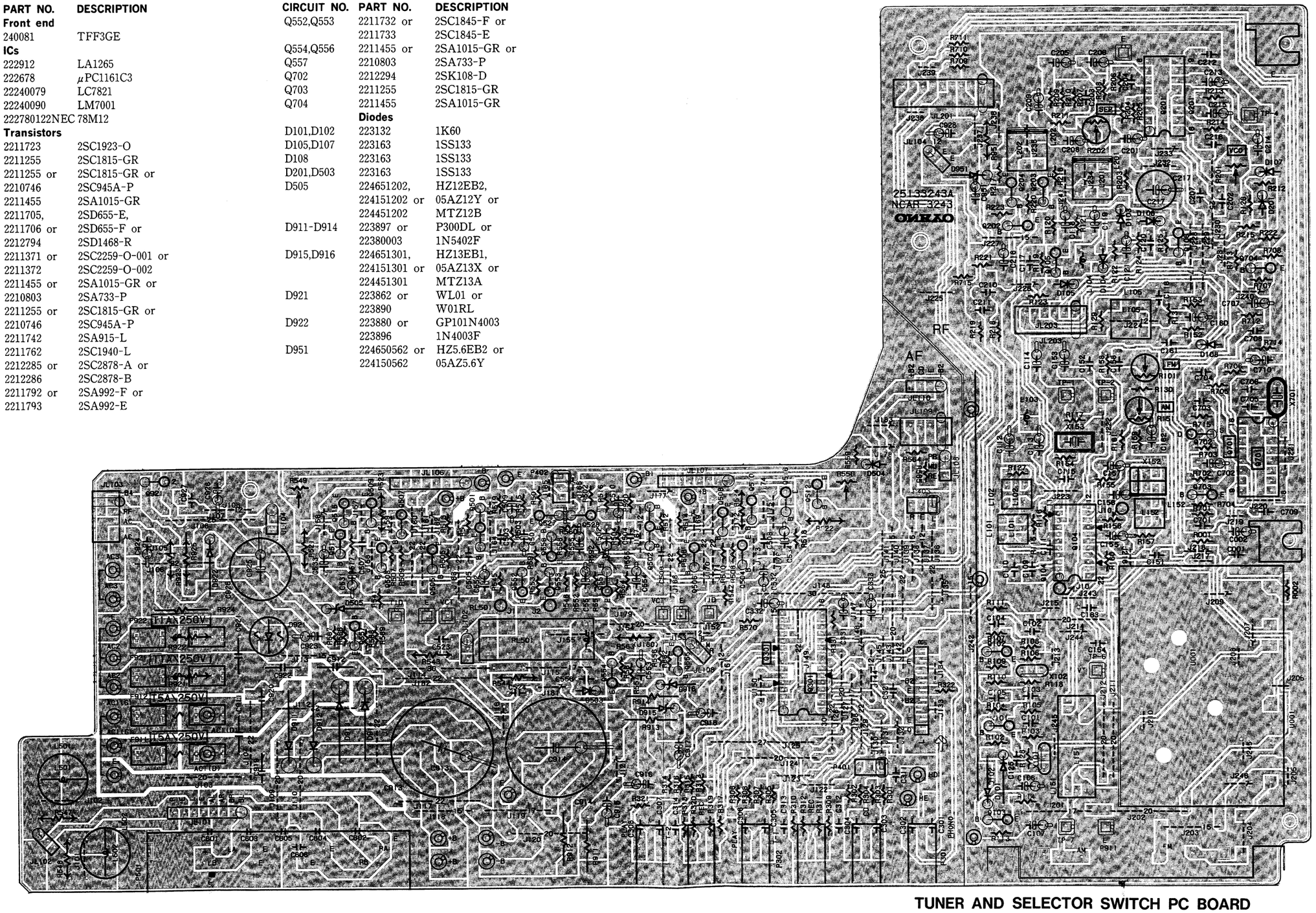
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE AND PARTS LIST

AM/FM TUNER AND SELECTOR CIRCUIT PC BOARD(NAAR-3243-1A)

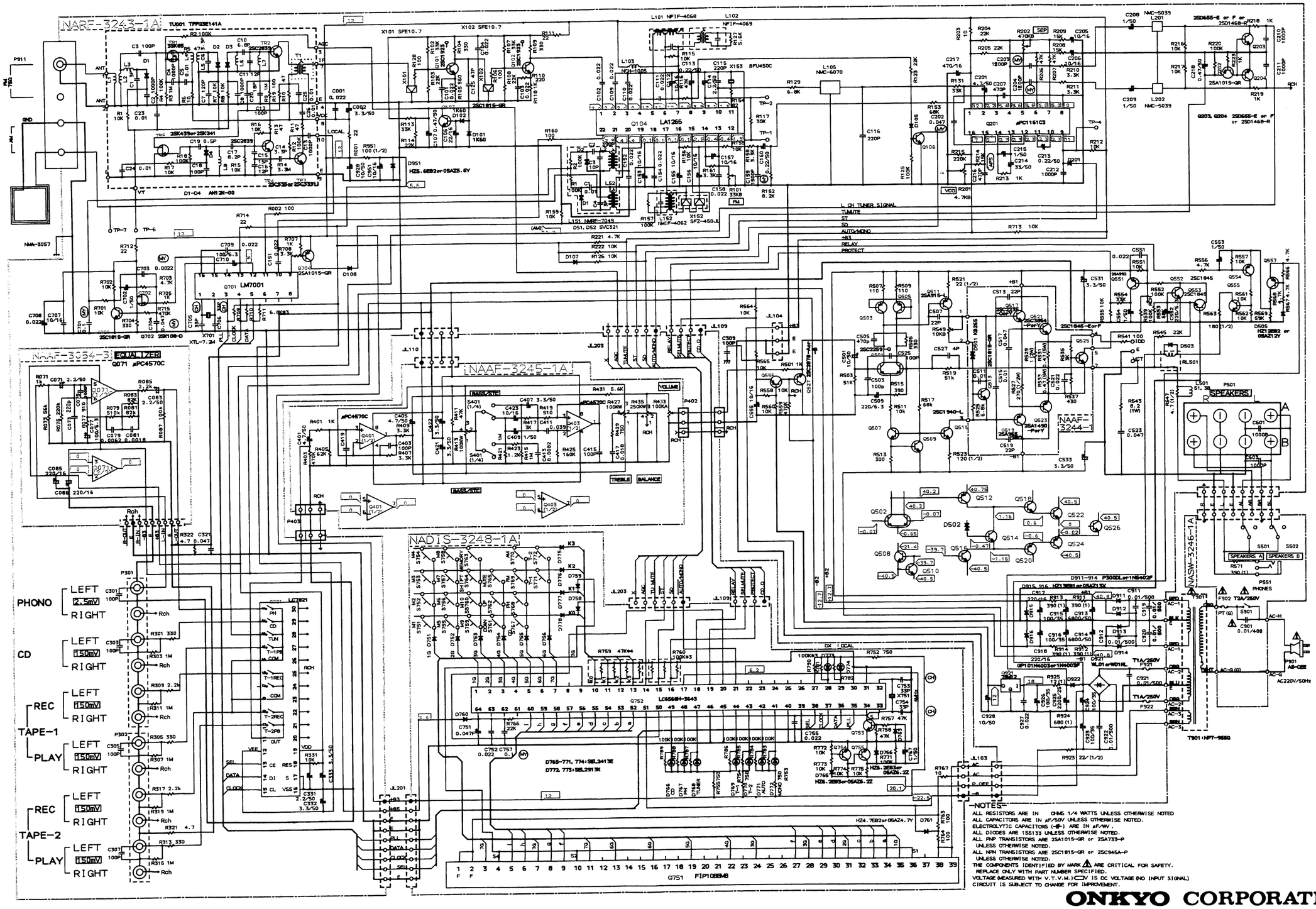
CIRCUIT NO.	PART NO.	DESCRIPTION
	Front end	
TU001	240081	TFF3GE
	ICs	
Q104	222912	LA1265
Q201	222678	μPC1161C3
Q301	22240079	LC7821
Q701	22240090	LM7001
Q921	222780122	NEC 78M12
	Transistors	
Q101,Q102	2211723	2SC1923-O
Q103	2211255	2SC1815-GR
Q106	2211255 or	2SC1815-GR or
	2210746	2SC945A-P
Q202	2211455	2SA1015-GR
Q203,Q204	2211705,	2SD655-E,
	2211706 or	2SD655-F or
	2212794	2SD1468-R
Q501,Q502	2211371 or	2SC2259-O-001 or
	2211372	2SC2259-O-002
Q503-Q506	2211455 or	2SA1015-GR or
	2210803	2SA733-P
Q507-Q510	2211255 or	2SC1815-GR or
Q555	2210746	2SC945A-P
Q511,Q512	2211742	2SA915-L
Q515,Q516	2211762	2SC1940-L
Q527,Q528	2212285 or	2SC2878-A or
	2212286	2SC2878-B
Q551	2211792 or	2SA992-F or
	2211793	2SA992-E

CIRCUIT NO.	PART NO.	DESCRIPTION
Q552,Q553	2211732 or	2SC1845-F or
	2211733	2SC1845-E
Q554,Q556	2211455 or	2SA1015-GR or
Q557	2210803	2SA733-P
Q702	2212294	2SK108-D
Q703	2211255	2SC1815-GR
Q704	2211455	2SA1015-GR
	Diodes	
D101,D102	223132	1K60
D105,D107	223163	1SS133
D108	223163	1SS133
D201,D503	223163	1SS133
D505	224651202,	HZ12EB2,
	224151202 or	05AZ12Y or
	224451202	MTZ12B
D911-D914	223897 or	P300DL or
	22380003	1N5402F
D915,D916	224651301,	HZ13EB1,
	224151301 or	05AZ13X or
	224451301	MTZ13A
D921	223862 or	WL01 or
	223890	W01RL
D922	223880 or	GP101N4003
	223896	1N4003F
D951	224650562 or	HZ5.6EB2 or
	224150562	05AZ5.6Y



TUNER AND SELECTOR SWITCH PC BOARD

SCHEMATIC DIAGRAM



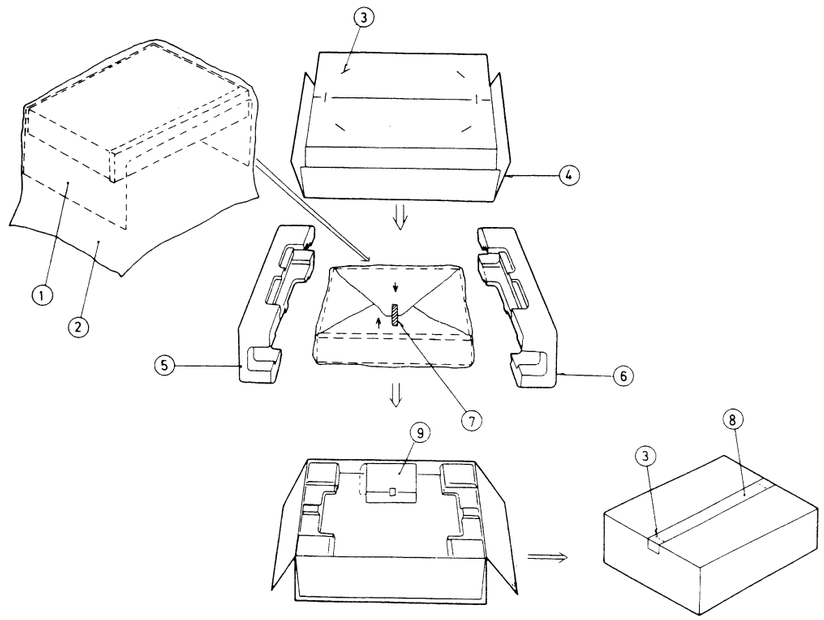
PRINTED CIRCUIT BOARD–PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Coils	
L103	233105	NCH-1005
L105	233383	NMC-6070
L151	232146	NMRF-7049
L201,L202	233291	NMC-5039
L501,L502	231001	S1.3B
	Transformers	
L101	233394	NFIF-4068
L102	233395	NFIF-4069
L152	232139	NFIF-4062
	X'tal	
X701	3010073	XTL-7.2M
	Ceramic filters	
X101	3010070	SFE10.7MS3GYA
X102	3010043	SFE10.7MM
X152	3010123	STZ450JL
X153	3010076	BFU-450C
	Capacitors	
C002	354780339	3.3 μF,50V,Elect.
C106	354742209	22μF,16V,Elect.
C107	354784799	0.47μF,50V,Elect.
C112	354741009	10μF,16V,Elect.
C113	354782299	0.22μF,50V,Elect.
C114	354780229	2.2 μF,50V,Elect.
C153,C155	354741009	10μF,16V,Elect.
C156,C157	354741009	10μF,16V,Elect.
C160	354782299	0.22μF,50V,Elect.
C201	354780479	4.7 μF,50V,Elect.
C205,C206	354741009	10μF,16V,Elect.
C208,C209	354780109	1 μF,50V,Elect.
C213	354782299	0.22μF,50V,Elect.
C214	354780339	3.3 μF,50V,Elect.
C215	354780109	1 μF,50V,Elect.
C216	370134714	470pF ±5%,100V,APS
C217	354744719	470 μF,16V,Elect.
C218	354784799	0.47μF,50V,Elect.
C331	354780229	2.2 μF,50V,Elect.
C332,C333	354780339	3.3 μF,50V,Elect.
C501,C502	354781009	10μF,50V,Elect.
C509,C510	354722219	220 μF, 6.3V,Elect.
C531-C534	354780339	3.3 μF,50V,Elect.
C552	354722219	220 μF, 6.3V,Elect.
C553,C554	354780109	1 μF,50V,Elect.
C555	354741009	10μF,16V,Elect.
C702	354780109	1 μF,50V,Elect.
C707	354741009	10μF,16V,Elect.
C710	354721019	100 μF, 6.3V,Elect.
C911,C912	335251039	0.01μF,500V,Ceramic
C913,C914	3504207	6,800 μF,50V,Elect.
C915,C916	354761019	100 μF,35V,Elect.
C917,C918	354742219	220 μF,16V,Elect.
C921,C922	335251039	0.01μF,500V,Ceramic
C923,C924	354761019	100 μF,35V,Elect.
C925	354752229	2200μF,25V,Elect.
C926	354761019	100 μF,35V,Elect.
C928	354781009	10μF,50V,Elect.
C951	354741009	10μF,16V,Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R101	5210067	N06HR33KBD,Semi-fixed
R201	5210062	N06HR4.7KBD,Semi-fixed
R202	5210074	N06HR470KBD,Semi-fixed
R521,R522	442522204	22ohm,1/2W,Metal oxide film
R523,R524	442521214	120ohm,1/2W,Metal oxide film
R543,R544	442520824	8.2ohm,1/2W,Metal oxide film
R547,R548	442520474	4.7ohm,1/2W,Metal oxide film
R549,R550	5210064	N06R10KBD,Semi-fixed
R563	442521814	180ohm,1/2W,Metal oxide film
R911-R914	441623914	390ohm,1W,Metal oxide film
R923	442522204	22ohm,1/2W,Metal oxide film
R924	441626814	680ohm,1W,Metal oxide film
R925	441621204	12ohm,1W,Metal oxide film
R951	442521014	100ohm,1/2W,Metal oxide film
	Fuses	
F921,F922	252070	⚠1A-SE-EAK
	Fuseholders	
	25050065	⚠YSH403T
	Relay	
RL501	25065275	NRL-2P5A-DC12-38
	Terminals	
P301,P302	25045213	NPJ-6PDBL-92,Input/Tape output terminals
P501	25060093	NTM-8PDML34,Speaker
P911	25060087	NTM-2PDMN31,Antenna
	Sockets	
	25050268	NSCT-4P96
	25050270	NSCT-6P98
	25050273	NSCT-9P101
	Radiator	
	27160219	RAD-68

NOTE:THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION
1	29095012-1	500 ×800mm,Protection sheet (Black model)
2	29100034	650 ×850mm,Poly-vinyl bag
3	282301	Sealing hook
4	29051668	Master carton box (Silver model)
	29051670	Master carton box (Black model)
5	29091242	Pad R
6	29091241	Pad L
7	261504	W=15mm,Adhesive tape
8	260012	W=50mm,Damplon tape
9	Accessary bag ass'y	
	292092	FM antenna
	29341240	Instruction manual
	232140	NMA-3057,AM loop antenna
	29100006A	250 ×350mm,Poly-vinyl bag
	29365020	Warranty card
	29100094A	Poly-vinyl bag for warranty card

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